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EDITORIAL

KEEP THE MEDICAL SOCIETY PROGRAMS UP-TO-DATE

Now that the fall and winter season approaches the officers of the County Medical Societies may well look to the building of interesting programs which will attract the members to every meeting. It has been said that a good dinner nearly always is successful in exciting the interest of the members and bringing out a good attendance. We believe in the long run nothing succeeds so well as a good scientific program, into which every contributor puts his best efforts. We are confident that the social side of the medical society should not be neglected, but this certainly should be a secondary matter. The scientific program cannot be constructed successfully in a haphazard manner; the committee having in charge this matter should give serious thought to it. No one blames the average doctor for not going to a meeting which prom-

ises little or nothing in the way of scientific interest. We have noted the past year or two that the district societies are keenly alive to their opportunity and without exception they are now attended by large numbers of physicians. Why? Simply because they have a well balanced program, carefully prepared, in almost every instance. Every county society should be a leader along these lines, inasmuch as the county medical society is the foundation stone of organized medicine in America.

ORIGINAL ARTICLES

THE UNINTENTIONAL NEGLECT OF CHILDREN'S EYES AND THROATS IN SCHOOLS OF RURAL DISTRICTS.

By C. E. Crosby, M. D., Greenwood, S. C.

I cast no reflections on anyone when I speak of the conditions of the throats and eyes in the children who are neglected by the parents and by the busy family physician who has time only to see and prescribe for those whom he is called upon to see, especially is this true in the rural districts. A recent investigation of a school in Garnett, Hampton County, S. C., revealed to me an appalling state of affairs.

Through the efforts and integrity of Mr. Thos. O. Lawton, chairman of board of trustees, a man of unusual far sight and love for his community, realized the importance of giving every child his or her just dues. He began a movement to have the throats of every child examined by the local physician. Dr. Peeples of Scotia, a most capable man, was called upon to make this examination. In this school of about seventy pupils, he found thirty-three (33) with diseased tonsils and adenoids. Mr. Lawton then came at once to Greenwood and talked with me about the possibility of having these little folk operated upon in their respective homes. Realizing the task of doing this in the homes would incur a great waste of time, the people of this hustling little town came together, worked in unison and equipped their own school house into a comparatively good and sanitary hospital. The floors and walls were washed and scrubbed with water and antiseptic solutions, cots were brought from the homes and in short order twenty-two were placed in two rooms, one room for the boys and one for the girls, a third room was fitted up for the operating room. (Note there was no electricity or water works), oil stoves were brought for sterilizing, etc. Realizing the need of quantities of towels and other things which needed washing and sterilizing, one of the teachers volunteered to look after this and did a most flourishing day's washing.

The State Board of Health realized the importance of this work, kindly consented to give us a physician, Dr. Knotts, and a nurse, Miss Fenton. These with the local physician, Dr. Peeples, we began work on April 26th. I examined all the children's throats and my findings corroborated with Dr. Peeples' almost to a child. With the combined efforts of these whole-souled parents and the teachers of this school, work went through like it might have been a nose and throat hospital of long standing. After seventeen hours of actual

work and without a hitch or complication of any kind, the job was completed. Thirty-three children and two adults. 'Tis true that at the beginning some parents were skeptical and hesitated to have anything done, but seeing everything moving along so nicely, the most skeptical threw aside every doubt and fear and volunteered to do anything he was called upon to do.

Today this community is happy in knowing that they have done their part toward making their children better boys and girls both physically and mentally, and a consequent better community for the future.

Why can't we who are specialists in this line of work go out and help the needy in the rural districts? Some will say they will come to us. 'Tis true a great many of them will and a great many will not. Those who will not are the ones we want to get at, for they are of parentage who are either skeptical, do not care, or think they can't afford it.

Now the remedy is, have the trustees drill into the mind of every parent the importance and necessity of this work. Have the family physician examine the children and report to the trustees the number of cases and let the Garnett High School be an example of what can be done by the people who want it done.

SOME INDICATIONS FOR CESAREAN SECTION WITH REPORT OF A SECTION UNDER LOCAL ANAESTHESIA.

By Robert E. Seibels, M. D., Columbia, S. C.

Read before the South Carolina Medical Association, April 20, 1921, Columbia, S. C.

In no field of surgery have greater advances been made than in the cutting operations of obstetrics. In particular, the Cesarean section, or abdominal hysterotomy—to use the modern term—has come to occupy a most important place in our work. This operation comes down to us from ancient times—the Egyptians are said to have practised it, as has been shown by pictures on the walls of the tombs. At first it was done as only a desperate effort to secure a living baby after the death of the mother during labor, and it is not until comparatively recent years that it was regarded as an operation to be done with any great hope of conserving the mother's life. In the last few years the indications have been so broadened by certain operators that the waggish remark has it that there are only two requirements for Cesarean section—that the woman be pregnant and that the husband have money.

While it may be that section has been performed unnecessarily in many cases and while two men of equal ability, experience and soundness of judgment, may take opposite views in a given case, one must not lose sight of the fact that the usually accepted indications for section are pretty clear-cut and we must not allow ourselves to be prejudiced against an operation because it has been misused. However, we must be on our guard against turning to section as an excuse for obstretrical laziness or ignorance.

We believe that the practice of obstetricians of turning sections to surgeons rather than doing them themselves and of surgeons of doing sections simply because the obstretrician said it was necessary, is partly responsible for the lack of the general understanding of the time and occasion for this operation. We consider that each case must be decided on its own merits—measurements that would be satisfactory in a young and vigorous woman with a small fetus, might well be the opposite in an elderly

primipara with high blood pressure and a large baby. Again we have a woman with good pelvic measurements—perhaps even large—but she has suddenly gone blind, high blood pressure, jaundice and vomiting blood: although the baby may have died or is too young to be saved, we may well feel that her life may be saved, and the future of her kidneys may be made more hopeful by the prompt delivery by section rather than waiting the several hours necessary for a proper dilatation of her cervix and delivery by version and breech extraction.

Bearing in mind the low mortality for mother and baby in section and the high mortality for both, either in high forceps or version with breech extraction, we should certainly consider also the mother's side of the question. Lose for her the first baby and subsequent pregnancies may assume such horrid proportions that she may never willingly conceive again. Give her a live baby —even at the cost of an operation of questionable necessity — and she is much more apt to view another pregnancy as simply her duty.

We can best illustrate our accepted indications by brief case reports.

Case I. L. J., white, age 27, ipara, 26 weeks pregnancy. Referred by Dr. J. J. Watson Nausea for first three months—only moderate. Otherwise pregnancy normal until Feb. 23, 1920, when she waked with headache, swollen extremities and face and dim vision which had become blindness by noon. Seen in consultation at 2:15 p. m., with B. P. 200-140, urine solid with albumen —sediment filled with hyaline and granular casts. Unconscious, general muscular twitching at first and convulsions during latter part of examination. Eye grounds showed marked albuminuric retinitis with hemorrhages. The total phtalein output was 45 the morning of delivery—within normal limits.

Section was done in the face of a non-viable fetus because of the rapid development and extension of alarming symptoms. The mother was home on the twentieth day after operation and has had no albumen or casts since May, 1920. The vision has come back to 15-20. We believe that the outlook would have been very grave in this case without rapid delivery.

Case II. J. P., white, 33 years, iiipara, 26 weeks pregnancy. Referred by Dr. E. C. Truesdell. Headache and edema with previous pregnancy. For two weeks has had headache, nausea, marked dyspnoea and failing vision and increasing edema to present. Seen in consultation June 11, 1920. Absolutely water-logged. B. P. 185-130. Urine solid with albumen. Hyaline and granular casts. Vision reduced to perception of light only. Cervix rigid—deeply lacerated. Hemoglobin 45 per cent We felt that the marked general edema, anemia and visual disturbances and the history of previous severe toxemias were sufficient to warrant immediate and rapid delivery with a minimum of trauma to her tissues. Section was done and four days later there was no edema, vision markedly improved She was discharged fifteen days later with very good kidney function.

Case III. R. H., white, age 21, ipara. At term. Referred by Dr. William A. Poyd. This patient had had blood pressure above 180 for six weeks in spite of being in bed, milk diet and free catharsis. Her toxemia was only moderate but her color was poor, she had a good deal of albumen, hyaline and some granular casts. We diagnosed a good sized baby and her measurements were all small, the justominor flat type of pelvis. We decided that we were faced

with either a section or a high medium forceps or version and breech. Her cervix was the usual rather long, rigid type of the young primipara and we were sure of a long hard labor with a big baby. The two possibilities were submitted to her and to her husband, and they requested section. At operation we found the true conjugate small and delivered a baby which weighed 8¾ pounds. Her convalescence was uneventful.

Case IV. R. S., white, age 31, ipara, 26 weeks pregnant. Like Case I this was sudden, violent outbursts of eclampsia in a previously well woman. Fourteen hours after she had been examined and found to have normal urine and blood pressure, she had a violent convulsion, pressure went to 200 and her urine was loaded with pus, casts and red cells. Section was performed and she reacted well to it. Her convalescence was complicated by acute rheumatic fever, pyelo-nephritis and abscessed teeth. This case is most suggestive of being of septic origin—that is, that sepsis was possibly the basis of the nephritic explosion just as we do see acute, overwhelming nephritis in other severe infections.

Case V. T. H., white, age 36; iipara. At term. Referred by Dr. Bruce Guignard. This patient had moderate toxemia of pregnancy which had grown worse under treatmen. She had had headache, edema and albumen during her first pregnancy and rather prolonged labor. We felt that the indications for section were perhaps not urgent in this case, but that any long labor would be very hard on her; she and her husband were very anxious for the avoidance of labor and they both wished that she be sterilized. She returned home for an uninterrupted convalescence ten days after Cesarean with the excision of the tubes.

Case VI. Negro, age 29, ipara. At term. Referred by Dr. Bruce Guignard. She resembled Case IV in having a possible septic origin for her sudden and violent eclamptic seizure, for she had passed a calculus on Feb. 16, 1921. On the 19th she waked up with headache and by 9 p. m. was markedly swollen and restless and shortly afterward went into convulsions. Her pressure was only 160 systolic. Her urine showed a heavy trace of albumen, casts and pus. Section was performed at midnight. Her convalescence was complicated by the continuance of a severe pyelitis.

Case VII. Syrian, age 33, ivpara. At term. Referred by Dr. Bruce Guignard. This patient had had twins and had complete separation of the recti muscles below the umbilicus—the uterus was completely out of the confines of the abdomen and pendulous. The fundus hanging down to the level of the vaginal orifice when she stood up. She was in labor and the uterine contractions were plainly visible through the skin, which with the peritoneum, alone covered the organ. A remarkable sight indeed—it seemed as though she would burst her abdomen open during uterine contraction. She was put to bed, the herniated uterus replaced as well as possible and a binder applied. After six hours of pains, no progress had been made, the head was not engaged, the position was transverse and the patient hysterical. We performed a section and removed both tubes. Her convalescence was normal.

Case VIII. D. W., white, aged 25, iiipara. At term. The history of the previous labors was that after prolonged, hard labor with medium forceps in both cases, normal looking babies were born which took a few breaths and died. Her husband, a physician, was most discouraged at the outlook. We examined her carefully and though her external measurements were nor-

mal and the pelvis felt roomy from below, we diagnosed high flattening and performed a section on Nov. 8, 1920. At operation, the promontory of the lumbo-sacral angle was found to jut forward and impinge on the inlet of the pelvis to a most marked degree. The closed fist could not pass through the inlet easily. Convalescence was rapid.

In these eight cases then, we hope to have shown you that we have not based our operation on one indication such as eclampsia, malposition, or small measurements. We have tried in each case to consider not only the present condition of the mother, but her future, not only the life of the baby but—in viable cases—its future; a side of the question that Dr. Guignard will present to you.

Our results are: Eight cases operated. No maternal deaths. No maternal shock. Eight babies delivered by section—all born alive, three were before the period of viability (28 weeks) and two of these lived four hours and one lived fifty-five minutes. Five babies viable, all living. Mortality for mothers and viable babies 0.

The last case we will detail for you is for the purpose of bringing to your attention a procedure that can be used in a most desperate case where a general anaesthetic may not be given with safety and one fears the shock of version or even normal delivery—a method particularly suited to cardiacs, nephritics, the tubercular and carcinoma cases.

Case IX. J. S., white, age 47, ixpara, 8½ months. Patient referred to Dr. J. J. Watson by Dr. E. C. Thomas of Jefferson, S. C., on April 19, 1920, complaining of dyspnea and edema. Since end of September (1 month pregnant) has had dyspnea, edema of the feet and shortness of breath. For six weeks previous to our consultation these had been increasing, with pallor and weakness. Now requires two pillows constantly, for she is very dyspneic.

Physical examination reveals a pale woman propped up in bed, very short of breath and marked edema of face, hands, extremities and abdominal wall. Heart enlarged to left axillary line and one inch to the right of the sternum. A loud, blowing systolic murmur at apex, transmitted to axilla and back and obliterating other sounds; at the base almost a continuous murmur. Pulse 140, regular. B. P. 140-100. Lungs, many coarse, bubbling rales. Liver and spleen not felt. Uterus two fingers below ensiforme cartilage. Position of baby L. O. A., fetal heart 156.

Blood examination, hemoglobin 23 per cent. Urine showed marked trace of albumen, hyaline and granular casts. Total urinary output in past 24 hours, 12 ounces. Her blood was typed by Dr. F. M. Routh and found to be "Type IV," and Dr. Watson transfused her by the citrate method, giving her 500 c.c. from her son.

We decided that the most probable result of even a short labor would be her death, as we did not believe her heart would take her through it, nor did we deem it possible for her to withstand any hemorrhage. Any general anaesthetic was ruled out, Dr. H. H. Griffin advising that even gas and oxygen would be most unsafe. We prepared for section under local anaesthesia, as our previous experience had shown that the blood loss by section was less than that usual to a normal labor and that it was ordinarily without shock.

Procedure. No morphia was given on account of its depressing action on the baby's respiration; 30 grains of chloral hydrate were given. Under ½ per cent novocaine, a right rectus incision was made. The uterus was pushed

up by pressure on the flanks, but was not delivered as this is painful to the patient, it blocks the veins but not the arteries and thus increases hemorrhage and it is not necessary. The uterine wall is insensitive to cutting and no novocaine was injected; 1 c.c. of pituitrine was given by hyperdermic just before the uterus was incised. The baby, weighing 6½ pounds, was delivered easily, breathed and voided urine promptly. After the placenta was delivered, a piece of packing was left in the uterus, the end through the cervix. The uterus was closed with two rows of catgut, the abdominal wall in three layers with catgut and silk worm.

The patient grew nervous toward the end and complained for the first time of pain when the silk worm tension sutures were put in the skin. Dr. Griffin then gave her a few breaths of nitrous oxide —just enough to divert her attention— and the wound was closed. The total operative time was 45 minutes, including the injection of the novocaine. She left the table in good condition, her breathing being easier. One hour later her pulse was 118.

Convalescence. For the next 24 hours her pulse was 118 to 132, her respiration 20 to 28. Under digitalis and diuretin and hot dry packs her edema disappeared, through a urinary output of 70 ounces a day and literally quarts of sweat. Her highest temperature was 99 in the first ten days.

Her wound healed by primary union. She slipped out of bed on the eighth day after operation to go to the toilet and on the tenth day, set out for her home by train, against our protests, as we felt that an hour's ride in a day coach would be rather hard on her. However, she survived it and wrote recently that she was well and the baby beautiful.

Discussion:

Dr. Jane Bruce Guignard (Columbia): I have had a few patients operated by Cesarean section, not one of which I regret. I remember when I was a medical student if there was a Cesarean section to be done all the students were invited down to see it done; but now it has become comparatively common because it is easy and usually safe. To my mind Cesarean section is not as dangerous as a great many other abdominal operations which are being done day after day. It is spectacular, of course.

The point I want to bring out is that Cesarean section is often safer, for the infant as well as the mother in certain serious situations. No woman goes through nine months of pregnancy without great hope of having a living child and it is a tremendous disappointment when a woman has gone through hard labor not to have the reward of a living baby. So it is worth some risk for the reward. We have all seen babies lost in the course of the slow process of dilating the cervix and delivering by high forceps. Then the question of the toxemia is important, and it is to avoid that I have used Cesarean section in chosen cases, to save the baby from that severe toxemia and probably save it from years of ill health because of impaired kidneys. Look back over the history of different families where the mother died in convulsions in confinement leaving a little girl baby, and then that little girl dies in confinement with her first baby. You have seen that more than once. What was it? Perhaps impaired kidneys from prolonged toxemia which might have been avoided by a Cesarean section. I have been studying the urine of these babies and find they may contain casts and albumin for months and even years after their birth. There is one little fellow particularly, now between four and five, that I have been watching closely. His mother lost her first baby in pregnancy and almost died herself from acute nephritis. The next time she had a case of fulminating toxemia. We delivered the child as rapidly as possible without a Cesarean section, and the baby was toxic for about a week. He is fairly well now but from time to time his urine still shows casts.

The point I want to make is that these children's kidneys may be impaired for life, and that the time saved by a Cesarean is very important. The point is to save these children from avoidable greater injury to their kidneys, for if they are girls they may easily succumb to toxic pregnancy, and if they are boys they are more liable to be injured by causes which bring on chronic nephritis. You can do a Cesarean and save the child's health as well as its life. My only regret is that more of my cases have not been delivered by Cesarean section. Several to avoid most dangerous mechanical difficulties. In several others babies have succumbed whom I believe could have been saved by a timely Cesarean section.

THE IMPORTANCE OF EARLY DIAGNOSIS OF GASTRIC CANCER

By Robert Wilson, Jr., M. D., Charleston, S. C.

Read before the South Carolina Medical Association, April 20, 1921, Columbia, S. C.

Attention has been frequently called in recent years to the increasing death rate from cancer. Frederick Hoffman says, "that in contrast to a marked decline in the general death rate, cancer remains one of the few diseases actually and persistently on the increase in practically all of the countries and large cities for which trustworthy data are obtainable." He estimates, "that there are now annually 80,000 deaths from malignant disease in the continental United States and that the disease is increasing at the approximate rate of 2.5 per cent per annum. If the present rate of increase continues unchecked the annual mortality in the continental United States will soon exceed 100,000." This increase involves most forms of cancer. "During the period 1900-12 cancer of the buccal cavity increased from 1.6 to 3.0; cancer of the stomach and liver from 22.5 to 30.6; cancer of the peritoneum, intestines and rectum from 5.7 to 9.8; cancer of the female generative organs, from 8.8 to 11.7 (or on the basis of female population from 9.1 to 14.9); cancer of the skin from 2.0 to 2.9; cancer of the other organs and parts decreased from 17.9 to 11.7.

In South Carolina the death rate from all forms of cancer has remained approximately stationary since 1916 as shown by the following figures:

1916	31.8 per 100,000
1917	31.9 per 100,000
1918	28.0 per 100,000
1919	31.5 per 100,000
1920	29.9 per 100,000

Gastric cancer constitutes about 33 per cent of all forms and appears to be increasing steadily. Smithies says that "the increase in gastric cancer is real and alarming. At the age of 40 and above it has increased more than 10 per cent for both sexes." From 1916 to 1918 the death rate from cancer of the stomach and liver in South Carolina showed a slight increase, but not as great as indicated by the figures of Hoffman and of Smithies based upon returns from the whole registration area:

1916	9.0 per 100,000
1917	11.7 per 100,000
1918	10.1 per 100,000

These figures indicate sufficiently the gravity of the cancer problem, one phase only of which it is the purpose of this paper to discuss briefly.

It is obvious that until the cause of cancer be discovered our only means of lessening the high mortality is to excise the diseased focus very early in its development. The statistics published by the Mayo clinic indicating that 38 per cent of cases of gastric cancer were well three years after the operation and 26 per cent five years after the operation are certainly very hopeful, although equally good results have not been reported by surgeons in general. I think

that everyone who has studied the subject and has followed his own cases must be impressed by the fact that by far the majority of gastric cancers reach the operating table too late, and the operation which was designed to give relief, even if not effect a cure, prove to be only an antemortem section. Each time the writer has witnessed such an operation he has gone away asking himself the question why was not the diagnosis made earlier, and the wider his field of observation grows the more profoundly is he impressed by the responsibility resting upon the physician, for the diagnosis of early malignancy seldom rests with the surgeon alone. We have to admit that the problem is often most baffling and that in many instances in the present state of our knowledge it is practically impossible of solution. Nevertheless, I cannot escape the conviction that something more can be done than is done. We are too prone to wait for the development of characteristic symptoms and laboratory findings. Nausea and vomiting, perhaps pain, hematemesis of coffee ground character, loss of flesh and strength, anemia, absence of hydrochloric acid from the stomach contents with presence of lactic acid and Boas-Oppler bacilli, miscroscopic or occult blood and a filling defect shown on the X-ray plate, give us a secure diagnosis even though we cannot palpate a tumor mass. But unfortunately, although we thus construct a perfect and satisfactory diagnostic picture, it is too late to apply hopefully the appropriate therapeutic measure. We have watched the patient, hesitating to advise operation until we were sure of our position, finding in the meanwhile, perhaps, a resting place in that antique conception of pathology which is embalmed in current nomenclature in the term bilious, and in the medieval superstition in the power of calomel to remove it.

The problem consists in determining the nature of the disease while it is still localized and there is hardly any diagnostic problem that presents greater difficulties. Wm. J. Mayo says that, "it may be stated as an axiom that carcinoma of the stomach per se does not produce symptoms upon which an early diagnosis can be based." Even well advanced cases are at times very puzzling and may present singularly few gastric symptoms, while the analysis of the stomach contents may be very misleading. A patient was admitted to the Roper Hospital having very few symptoms besides pain in the epigastrium after eating. Stomach contents showed a total acidity of 75, free hydrochloric acid 45, combined hydrochloric acid 20, no lactic acid and no blood. Blood, however, was present in the feces. An exploratory laparotomy was performed and an inoperatable carcinoma involving the head of the pancreas and the pylorus was found.

There are so many uncertainties surrounding the early diagnosis that it may be laid down almost as axiomatic that every case involving gastric symptoms, especially in middle life, should be approached from the view point of possible malignancy, and we must advise exploratory incision much oftener than has been our custom if we are to attack the disease soon enough to lower the present death rate.

Many cases present a long standing history of symptoms indicating gastric ulcer. According to the statistics of Wilson and McCarty 71 per cent of gastric cancers developed upon an ulcer base, in Pauchel's series 80 per cent were traceable to previous ulcer, while other writers give varying figures. As a result of such studies the opinion is

now held generally that at any rate the large majority of cancers of the stomach develop from chronic ulcers, or as Smithies expresses it, "the early diagnosis of gastric cancer concerns itself with the recognition of chronic calloused peptic ulcer, particularly of the recurrent form," and he intimates his belief that only by an exploratory operation can the correct opinion be reached, when he says that the early diagnosis of gastric cancer is a microscopic one.

There is one very important point which must not be overlooked in studying patients who present symptoms of stomach involvement, namely that while gastric symptoms are among the commonest of which patients complain we are reminded continually that these symptoms do not mean gastric disease necessarily. The first step in every case, therefore, is to make a complete survey of the patient in order to determine the existence, or non-existence, of an extra-gastric disease which might account for the symptoms. One of my patients, for example, complained of gastric distress amounting at times to pain after eating, anorexia, nausea, rather rapid loss of weight. She was moderately anemic. Examination revealed a somewhat enlarged thyroid and a rapid pulse. Gastric analysis showed nothing more than a slight reduction of the hydrochloric acid content. X-ray examination was negative. The basal metabolic rate was plus 47. Under rest and X-ray treatment of the gland preliminary to operation the gastric symptoms disappeared. When extra-gastric disease is found, however, we are not thereby relieved of the necessity in every case of making a very thorough investigation of the stomach function since it is obvious even though a patient is suffering from some general or remote disease which may cause gastric dysfunction, organic disease of the stomach may likewise exist.

The chief gastric symptoms pointing to malignant disease are anorexia, vomiting and pyrosis, dyspepsia which is often painful. These symptoms may have existed for a long period of time, perhaps for years, pointing to chronic ulcer, or they may have developed rather abruptly only a short time before the consultation. General symptoms indicating malignancy are loss of weight and strength with a greater or less degree of anemia. These symptoms are present in varying associations, and we are often surprised to find how little inconvenienced one may be even with an advanced malignancy. One of my patients complained of substernal pain after eating, poor appetite and weakness, but said that his digestion was good. He proved to have an advanced carcinoma of the cosophageal end of the stomach with secondary deposits in the liver, and died shortly afterwards. Another with pronounced lesion at the oesophageal end of the stomach and metastases causing well developed ascites, was of good complexion, complained but little of any discomfort save that which was due to the large amount of fluid in the abdomen and was able to attend the "movies" frequently. Cases giving a long history of indigestion may be puzzling. A periodic drinker with indigestion of many years duration began to lose weight without aggravation of his gastric symptoms. Stomach contents were characteristic of malignant ulcer and operation revealed a large growth on the posterior wall. His chronic indigestion had obscured the onset of malignancy until it was too late to afford relief. In the early stages physical examination may reveal little or nothing of any value. Anemia is not yet striking. Localized tenderness in the epigastrium may be elicited, and if

the malignancy has developed upon the basis of an old pyloric ulcer there may be stenosis of the pylorus with visible peristaltic waves and a dilated stomach. The laboratory findings are too familiar to require detailed enumeration. Here again the proper evaluation of our findings requires a complete study of the cases as a whole. Emphasis should be laid especially upon the presence of lactic acid and blood, if macroscopic or microscopic the altered character of the blood is particularly significant. Occult blood in the gastric contents and in the stools is very significant likewise, if proper precautions be taken to exclude other possible causes, or sources of error in technic. The absence of hydrochlorie acid is of course of considerable value if interpreted in connection with other findings, but striking exceptions may occur as in the case already alluded to in which analysis showed a normal amount of hydrochlorie acid, although an inoperatable cancer was found involving the pylorus.

Carcinoma of other organs may give findings suggestive of gastric involvement. A patient fifty years of age came to my clinic with jaundice. He had no pain and had lost only about ten pounds in weight in the past few months. He had vomited only once and had not been nauseated since. His appetite was always good. Examination revealed marked anemia, hemoglobin being 50 per cent, occult blood in feces. Gastric contents showed a total acidity of 9, free hydrochlorie acid 2, combined hydrochlorie acid 3, no lactic acid and no Boas-Oppler bacilli. Occult blood was present by the guaiac test. X-ray was negative. Diagnosis was made of malignancy, probably gastric, with metastatic involvement of the liver. The operation revealed malignancy of the head of the pancreas with no involvement of the stomach.

Roentgen examination should be made in all cases. Carman says that, "the Roentgen ray can discover 95 per cent of all gastric tumors of which only about 50 per cent are still of the operatable stage." My own experience has taught me to place great reliance upon the radiographic report when positive, but there are a small number of cases, especially very early cases, in which we obtain negative findings. I have already quoted one. Another case came under observation recently which presented few gastric symptoms. Three examinations of the stomach contents were made. First: Total acidity, 10; free hydrochlorie acid, 0; combined hydrochlorie acid, 2; lactic acid, 0; blood, altered in character, present; Boas-Oppler bacilli, present. Second: Total acidity, 22; free hydrochlorie acid,, 3; combined hydrochlorie acid, 7; lactic acid, 0; blood altered in character, present; Boas-Oppler bacilli, present; a few polyhedral cells. Third: Total acidity, 12; free hydrocholric acid, 2; combined hydrochlorie acid, 3; lactic acid, 0; blood, altered in character, present; Boas-Oppler bacilli, 0. Stomach washings in early morning showed a small amount of blood and no food remnants. Roentgen examination was negative twice. Operation revealed an early gastric malignancy which unfortunately was not primary, but secondary, so that nothing could be done to help the sufferer. Had this been a primary stomach case the patient's life probably would have been saved, certainly prolonged for several years.

The question of operation comes up in every case and it is often most difficult to decide. While it is true that many explorations are performed needlessly, on the other hand, our experience

teaches us that too few malignant cases are operated upon sufficiently early. Conservatism is a virtue, but there is such a thing as being too conservative and we should not in the name of conservatism lose precious time. The increasing frequency of cancer of the stomach, the high mortality attending surgical treatment when postponed too long, the necessity of early operation if the disease is to be checked by removing it while still localized, make it essential that every case presenting gastric syptoms be thoroughly and conscientiously worked out, and further that every gastric case, the cause of whose symptoms cannot be determined satisfactorily be advised to submit to an exploratory incision, and that chronic gastric ulcers be treated surgically, not medically. It is our duty to teach the public the truth about cancer of the stomach as we are teaching them the truth about cancer of the breast and of the female generative organs. The public are in a receptive state of mind and when the plain facts are called to their attention I am confident that our efforts will receive cooperation.

SURGICAL RENAL DISEASES

By Milton Weinberg, M. D., Sumter, S. C.

Read before the Seventh District Medical Association, Sumter, S. C., July 7, 1921.

Surgery of the kidney offers one of the most interesting chapters in surgery. It grew up over night. And we may truly say that the emerging from the darkness to light took place with great speed. We may say that it is nothing short of miraculous to have now a mortality of from 1 per cent to 5 per cent as compared with the mortality statistics produced by Dr. S. D. Gross of Philadelphia in 1885 of from 20 per cent to 60 per cent.

The history of surgery of the kidney is a most interesting one. Walcott, an American surgeon, in 1916 performed a nephrectomy for cancer, this was done by the transperitoneal route. The patient was a woman 58 years of age. She died on the fifteenth day following the operation. In 1868, Peasly did a nephrectomy, also transperitoneally, for neoplasm. The patient died. Gilmore, in 1870, did the same sort of operation, but had better luck, the patient having recovered. The first lumbar operation was done by Simon, of Heidelburg, in 1869. The operation was successful. Before attempting this operation Simon was greatly perplexed. He did not know whether or not a ligature would hold the large renal vessels, nor did he know what effect the tying of the renal vessels would have upon the patient. To satisfy himself, he experimented on thirty dogs, and found to his great delight that the loss of a kidney through operation was consistent with life. The first English surgeon to perform such an operation was Durham, in 1872, and was first done in France by LeFort. In 1879 Pilcher collected fifteen cases. In 1885 Dr. Gross of the Jefferson Medical College of Philadelphia collected 450 cases.

William Ingalls of Boston, through a lumbar incision, in 1872, probably did the first successful nephrolithotomy, removing a large calculus. He not having reported this case until 1882, the credit has been given to Morris of England for first doing such an operation. Morris made a report of his case in 1881.

Hahn of Germany, in 1881, introduced nephropexy. Bassini, Edebohls and Watson improved Hahn's method of nephropexy. Keyes of New York made a contribution to surgical nephritis.

It remained, however, for further discoveries and invention to be made later to do intelligent kidney surgery. The cystoscope was invented by Nitze of Austria, in 1876. In 1879, Edison's invention of the incandescent electric bulb led to ureteral catheterization. X-ray and pyelography, and functional test came later. In 1910 Rowntree and Geraghty of Baltimore introduced the phenolsulphonephthalein test for renal activity. In 1914 Burns of Baltimore discovered an opaque non-toxic substance, thorium nitrate, which could be introduced into the pelvis of the kidney and the ureter through the ureteral catheter for pyelograms and ureterograms, and into the bladder for cystograms. Urology now has the most perfect instruments for diagnosis and therapy in the entire field of medicine and surgery.

Surgical operations on the kidney are usually done for the following general conditions:

1. To remove foreign bodies, such as calculi, etc.
2. To open and drain an infected kidney, as in any abscess.
3. To correct misplacement.
4. To remove the kidney.

The following lesions are the common ones that usually require operation:

1. Contusion and rupture.
2. Renal calculus.
3. Tuberculosis of the kidney.
4. Pyogenic infections, such as pyelitis, pyonephrosis, etc.
5. Hydronephrosis.
6. Neoplasms of the kidney.
7. Congenital abnormalities, such as ectopic kidney, etc.

Contusion and rupture. Frequently nephrectomy must be done. Contusion and rupture is usually diagnosed by history of injury, particularly over the lumbar region, evidence of shock, tumor in the loin, and blood in the urine. In some instances cystoscopy and ureteral catheterization are required.

Renal calculus. The symptoms of renal calculus must necessarily depend upon the location of the calculus. Furthermore, the presence of a calculus may give rise to complications such as pyelitis, and pyonephrosis that the symptoms may point to the secondary involvement. The presence of a stone in the cortex of the kidney will give you a different clinical picture from stone in the pelvis. A stone may lay dormant in the cortex of the kidney for years without any symptoms whatever. One or more in the pelvis of the kidney usually produce attacks of renal colic. This colic is caused by the partial obstruction to the flow of urine. It is very doubtful that a stone ever totally constructs the passage of the urine down the ureter for very many days. If it did, and we got an impacted stone there would not be an attack of renal colic, nor would there be subsequent hydronephrosis, but on the other hand, if the impaction kept up for a period of several weeks or little longer we would probably get an atrophy of the kidney. This would really amount to the same as ligating a ureter, which would cause no clinical symptoms. A diagnosis of renal calculus can not be made from the history, for we know that the following conditions may cause attacks of renal colic: Simple pyelitis, stricture of the ureter, a twist of the ureter, hydronephrosis, stricture of the urethra, seminae vesiculitis and some conditions from the outside that may press upon the ureter. Careful X-ray examinations and frequently in addition cystoscopy with ureteral catheterization, and pyelography, must be resorted to. It must constantly be borne in mind that a collection of pus in the renal pelvis may give an X-ray shadow suggestive of stone. It must also be remembered that

lymph glands outside of the urological tract may give similar shadows. Occasionally, there may be confusion with gall stones. In surgery of the kidney for calculus there is nothing more important than the estimation of renal activity. It is imperative that the function of the diseased kidney under consideration must be estimated as well as the function of the opposite kidney. Both of these estimates are necessary. The phenolsulphonephthalein test is the best. It is not necessary to do nephrectomy for calculus if the function of that kidney is not almost totally destroyed. If that kidney has lost all of its function there is no doubt that the kidney should be removed. If there is a fair function it is only necessary to remove the stone, because as a rule the kidney will recover its function after the stone has been taken out. This holds true usually in the presence of a stone with infection. Too, not only will the kidney recover its function, but the infection will subside and usually disappears under the pelvic lavage through ureteral catheter, and on the removal of the offending body. While it is quite true that some of the cases where nephrectomy has not been for stone and only nephrotomy, that subsequent destruction of the kidney will take place necessitating a nephrectomy. It does not alter the procedure that I have outlined above. There is good chance for a kidney to recover its function if careful examination has not shown too great a destruction and two good kidneys are always better than one good kidney. Large irregular branching stones which sometimes almost fill the pelvis of the kidney may be removed through nephrotomy. It is a good procedure, and I think the most logical one, to decide on nephrectomy or nephrotomy after the kidney has been explored. Of course, too, we must not forget our functional test and pyelograms. Pelvic lithotomy is indicated in the ordinary stones or the renal pelvis. A thorough examination of cortex and pelvis has to be made in order to be sure that no calculus is overlooked. If extensive destruction of kidney tissue is present, nephrectomy is indicated, if a good portion is healthy nephrotomy.

Tuberculosis. When surgical interference is indicated in this type of renal disease nephrectomy is practically our only choice of operation. Besides the general rules differential renal functions, etc., which guide us as to whether a kidney should be removed or not there are some other considerations to be had in surgery for tuberculosis of the kidney. I may state that renal tuberculosis early in life, before the age of puberty, does not call for surgical interference as a rule. In one so young there is usually a general tubercular infection. Extensive pulmonary tuberculosis would contra indicate operation. Extensive tuberculosis of both kidneys would contra indicate operation. If one kidney is extensively involved, and the other one only slightly involved it may be well to remove the one most diseased. Very extensive involvement of the bladder or involvement of the other portions of the urogenital tract would call for careful consideration as to operation. Genital tuberculosis does not in itself contra indicate nephrectomy. If the bladder alone is involved along with the renal infection nephrectomy is beneficial. Even though tuberculosis of the kidney is most often secondary to tuberculosis of the lungs, nevertheless, the lung lesion may be so inactive or may have healed and thereby in such a case nephrectomy would be the choice of procedure. Two important points must be remembered in performing nephrec-

tomy for tuberculosis of the kidney, the peritoneal fat must be removed completely and the cut end of the ureter isolated. If these are not done secondary infections and serious results may follow. Isolation of the ureter may be done by bringing the cut end of the ureter through the lumbar incision or by anchoring a rubber tubing over the ureter that has been cut, allowing drainage through this rubber tubing. Tuberculosis of the kidney usually begins in the cortex, usually the lower pole, sometimes the upper pole. It begins as a miliary tubercle, caseating in its central portion, becomes secondarily infected, destroying markedly the kidney substance, and frequently communicating with the pelvis of the kidney. So we may see that the diagnosis of early renal tuberculosis may be difficult.

The diagnosis of advanced renal tuberculosis is never difficult. There is one important point that must be remembered in making examination for this disease, and that is, that the tubercle bacillus may be found in the urine without any renal lesion, as in bacilluria of any other type. The most common symptom of renal tuberculosis is frequency of urination. The bladder becomes quickly involved. Often the diagnosis from cystoscopic examination, noting either miliary tubercles frequently around the ureteral orifice of the side affected or tubercular ulceration at the orifice or other portions of the bladder, may be made. In speaking of tuberculosis of the bladder one important fact comes to my mind, and this must be remembered, that is, primary cystitis is a rare condition. Cystitis is a common condition, but almost always due to a primary lesion in some other portion of the genito-urinary tract, or if in bladder to stone, tumor, ulcer, etc. It is evident, therefore, do not treat the cystitis altogether, but treat the cause. Hematuria is often one of the early signs of renal tuberculosis. However, hematuria may be caused by other lesions. X-ray examination of the kidney often shows a characteristic appearance of the cortex. Braasch, of the Mayo clinic, has brought this fact out very nicely. The shadows are usually distinguished from those caused by calculi.

Pyogenic infections. The colon bacillus and the staphylococci are the most frequent invading organisms. The colon bacillus does not as frequently cause as extensive lesions of the kidney parenchyma as do the pus forming organisms. However, there may be mixed infections and the cortical substance destroyed that there remains only a mere shell of the former kidney substance. With such a case nephrectomy must be done. In some cases of pyogenic infection where it is not advisable to remove the kidney on account of the condition of the other kidney, simple drainage may be instituted. Acute pyogenic conditions of the kidney are usually determined by chills, high fever, tenderness over the kidney region, many pus cells from the diseased kidney. The leucocyte count is usually high. Sometimes a perinephritic abscess forms and drainage of this abscess may suffice. Pyogenic infection with loss of function of the kidney as determined by the phthalein test always indicates operation, unless there is some other serious contra-indication.

Misplacement. This condition usually exists alone with ptosis of the abdominial viscera and is a part of a general condition found in patients very poorly nourished. The treatment should be to build up by the fat, by rest on bed, elevation of foot of bed, and milk diet for at least six or eight weeks. Nephropexy is now discarded practically except for twist of ureter with hydronephrosis.

Hydronephrosis. This condition may be due to an obstruction either in the ureter or urethra. In some cases it is due to pressure on the ureter. Hydronephrosis is either congenital or acquired. The most common cause of congenital hydronephrosis is stricture of the ureter. Adventitious blood vessels are probably concerned in the etiology of some of the cases. With an abnormal movability of the organ we may readily see how these vessels could bring about such a condition. Hydronephrosis may be found at any age, from infancy to old age. Stone inflammations commonly cause hydronephrosis. In the urethra stricture and prostratic hypertrophy produce it.

Small hydronephroses may exist without any symptoms. In such cases it is usually not necessary to interfere surgically. Where an adventitious blood vessel brings about the condition and there is not very marked destruction of renal tissue division of this vessel will suffice. If the sac is very large nephrectomy would be the choice of procedure, provided the other kidney has been found to be normal.

Neoplasms of the kidney. Tumors of the kidney may be classified as follows:

1. Hypernephroma.
2. Mixed tumors.
3. Adenocarcinoma.
4. Papilloma of the renal pelvis.
5. Angioma of the renal pelvis.

Tumors of the kidney are encountered at all ages. The hypernephroma is the most common, occuring most frequently from the 40th to 50th year. The origin of this tumor is supposed to be from adrenal tissue. Similar tissue has been demonstrated in other parts of the body, as the testis, liver, peritoneum, and in the region of the ovaries, and kidney capsule. Metastases are most frequently located in the long bones, the bones of the skull, the lungs, the liver, the brain and the spinal cord. The common symptoms are hematuria, pain, and the presence of a palpable tumor. Varicocele may be noted as a symptom. It is usually painless, rapid in formation and appears on the side from which the growth occurs. In making a urological diagnosis, the following examinations should be made, urinalysis, ureteral catheterization, radiography, pyelography, renal function, and X-ray examination of the bones and lungs for metastasis. If there is no contra-indication nephrectomy must be done. The prognosis is bad.

Congenital abnormalities. Under this head ectopic kidney and the fused or horseshoe kidney present the most common types. The ectopic kidney is sometimes found as far down in the pelvis as to be at the level of the promontory of the sacrum. The pedicle contains blood vessels arising from the iliac vessels. If such a condition is not causing marked symptoms surgical interference is not indicated. An ectopic kidney is subject to the same pathological condition as the normal. A pyelogram will clear up the diagnosis in regard to an ectopic kidney. In the horseshoe kidney exact knowledge of the other kidney should be obtained. Sometimes it may be absent. It may be necessary in horseshoe kidney to remove only the diseased portion.

Operative technique. Rarely is it necessary to do renal surgery except by the extra peritoneal route. My choice of incision is as follows: An incision is made 1½ inches above the crest of the ilium and in the mid-axilliary line for several inches. The muscles and deep fascia are cut through. The incision is extended back parallel with the last rib. This gives a good exposure of the kidney. A large incision is always preferable as an extensive one does not effect the outcome.

THE WASSERMANN TEST, ITS RELIABILITY, SIGNIFICANCE AND LIMITATIONS.*

By H. M. Smith, M. D., Columbia, S. C., Hygienic Laboratory, State Board of Health of South Carolina.

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I. Development and Handicaps.

In 1901 Bordet and Gengou described a new procedure for the diagnosis of infectious diseases, based on the phenomenon known today as complement fixation. It is a specific immunologic phenomenon dependent upon the presence of the actual infective agent in pure culture, its specific antibodies, and the binding or fixing substance called complement.

In 1906 Wassermann described a method for its indirect application to syphilis, known since that time as the Wassermann test. As the **Spirochaeta pallida** (discovered by Schaudinn in in 1905) could not then be grown in pure culture, Wassermann substituted for such culture an aqueous extract of the liver of a syphilitic fetus. It was soon found that equally good results could be obtained not only with alcoholic extracts of normal organs containing no **spirochaetae pallidae**, such as human, beef or guinea pig heart, but even with certain chemical reagents, such as cholesterol and lecithol—none of them being specific antigens. In fact, when pure culture of the **spirochaeta pallida** became available through the work of Noguchi in 1912, it was found that this culture was far less satisfactory as an antigen than the ordinary lipoidal tissue-extracts. In addition, it was learned that the so-called antibodies in syphilitic serum, with which the Wassermann reaction is concerned, are not true specific antibodies, but only an antibody-like substance which has a great affinity for lipoids and in mixture with them will cause the fixation of complement.

There were thus introduced into the Wassermann test certain non-specific factors which have been a source of constant dispute up to the present day. In spite of the enormous efforts that have been made to standardize the technic of the Wassermann test, it still remains a non-specific biologic test, based on no certain biologic principle. Such a diagnostic reaction, capable of being varied by so many factors, must of necessity be productive of some discordant results.

On account of the great need of determining the exact reliability of the test and of standardizing its technic, an attempt to solve this problem was begun in 1915 by a committee of nine serologists of the larger institutions in Greater New York, with Dr. Haven Emerson as chairman. After two seasons of painstaking labor the work was left unfinished, and so it remains today. There is, therefore, as yet no standard technic, no common modus operandi adopted by all workers, and as a consequence varying and diserepant results are reported from time to time. Many clinicians, who do not entirely understand the situation, often sharply criticise laboratories and serologists in general and in particular, while many others, on the other hand, who properly appreciate the difficulties, wonder at the actual accuracy of the test and its conformity with their clinical findings.

II. Causes of False or Misleading Reactions.

1. Ingestion of alcohol, whether as an alcoholic beverage (even under national prohibition) or as an alcoholized

medicine, within 24 hours of the withdrawal of blood may produce a false negative.

2. Ether or chloroform anesthesia may produce a positive reaction, which, however, will later disappear.

3. Potassium iodide, mercury or arsenical preparations in case of syphilis may weaken the reaction. Craig states that administration of potassium iodide to non-syphilities will often produce a positive reaction.

4. It has been recently reported by Strickler and his associates that the intravenous use of arsphenamin in a series of non-syphilitic patients with various skin disease changed negative Wassermanns into strongly positive reactions.

5. Who in reality knows the effect on the blood, as far as this reaction is concerned, of the hundreds of other drugs, single or combined, self-administered or medically prescribed? And how many physicians on procuring blood specimens inquire into the exact history of their patients' use of drugs?

6. Fever may produce a false positive reaction, as in pneumonia and other febrile conditions. During the height of the fever a positive reaction may occur, while some days later, when there is no fever, blood from the same person may give a negative reaction.

7. Yaws, relapsing fever, trypanosomiasis, tubercular leprosy, yellow fever, malaria, scarlet fever, pellagra, Vincents angina, active ulcerating lesions in malignant tumors, and certain liver conditions with jaundice, are reported by reliable workers as having given non-specific positive reactions. This is particularly true of yaws and tubercular leprosy.

8. (a) In each form of syphilis itself a certain percentage of cases without any treatment fail to show a positive reaction—especially is this true of latent syphilis of the nervous system and of visceral syphilis—and, of course, numerous cases under treatment give a negative reaction from time to time, though still uncured.

(b) In poorly nourished and mentally retarded children suspected of congenital syphilis discrepancy in results is obtained, so much so that in these cases it seems to some observers that the Wassermann reaction is of little value in determining the diagnosis.

(c) In cases of known syphilis sudden changes from a positive to a negative reaction occur, and vice versa, without any relation whatever to treatment, no matter what the type of antigen or the method of fixation used.

(d) Certain old cases, clinically syphilitic, may give a negative reaction which under treatment changes to positive. This has led to the so-called provocative Wasserman reaction, which in 1910 was announced to be valuable both as a method of diagnosis of latent syphilis and as a test of cure. Some observers, such as Stokes and Nichols, believe that this provocative test has a distinct and useful field of application, while Pollitzer, King and others condemn it as likely to give misleading results, particularly as a test of cure.

9. There is evidence that blood which has stood for some time may give positive results in non-syphilitic cases, because of contamination.

10. Evidence has also been presented to sustain the belief that blood taken too soon after a full, heavy meal may give a false positive reaction. Such blood is, at least, often anticomplementary.

11. Under this heading, for the sake of convenience, may be classed all reaction results reported as anticomplementary. In such specimens certain substances are present in the sera which absorb or combine with complement in

the absence of antigen and thus vitiate the results of the test. This occurs usually from contamination or hemolysis of the specimen, particularly when the weather is hot or the specimen too old. Even when all precautions are observed, some specimens are still anti-complementary, especially diabetic and other chylous blood, and the sera of new-born infants and of certain cases under anti-syphilitic treatment.

III. Causes of Conflicting Reports From the Same or Different Laboratories.

1. Varying with type of **antigen** used, different laboratories may report different results. There are three antigens in general use—cholesterolized, acetone insoluble and alcoholic—each usually extracted from beef or guinea pig heart. They vary in delicacy, the cholesterolized being the most sensitive, the acetone insoluble next, and the alcoholic probably in general the least sensitive. Too delicate antigens may give falsely positive results, while antigens of too little sensitiveness may cause false negative reactions. Dependent upon the antigen used it can be readily seen how one laboratory may report a positive, another a doubtful, and possibly another a negative, all on the same serum, and that each laboratory may be accurate in its report according to its technic. The majority of serologists and clinicians are inclined to the belief that the Wassermann test is not delicate enough, while others are of the opinion that it is becoming too sensitive.

2. After adding complement to the mixture of serum and antigen, the method employed for bringing about **fixation** of complement may cause conflicting reports. Three methods may be noted—fixation in the water-bath at 37 deg. C. for one hour, fixation at room temperature (20 deg. C.) for one hour, and fixation in the ice-box at 8 deg. C. for four hours or more. The room temperature is the least accurate, while the ice-box method gives a higher and more accurate percentage of positives than the water-bath method. Thus again is there the possibility of a negative reaction from the water-bath or room temperature method and of a positive reaction from the ice-box method. When, for example, some unforeseen accident occurs at the laboratory, necessitating at the time the use of some method of fixation other than the regular refrigeration method, let us say, it becomes evident that the same laboratory may send out conflicting reports on two specimens from the same individual tested on different occasions.

3. When the anti-sheep hemolytic system is used as the indicator for reading the Wasserman reaction, an error may creep into the results, with some methods of technic, from the fact that some human sera contain a **natural amboceptor** against sheep's red blood cells, which may cause false negative reactions, unless due allowance is made for its presence and control.

In connection with the use of sheep-rabbit amboceptor text-book authorities state that a **titer** of 1-500 is satisfactory. However, our experience at the S. C. State Board of Health Laboratory has demonstrated that a titer of at least 1-1500 is necessary to give uniformly satisfactory and reliable results.

IV. Interpretation.

In a series of nearly 50,000 Wassermann tests since my connection with the South Carolina State Board of Health Laboratory we have encountered there many of the conditions mentioned herein, and yet, on account of the many inherently difficult technical

factors, it does not seem that the time is ripe for standardization of the technic for common use by all laboratories. In comparison, however, with other laboratory tests the results from the Wassermann test are extremely satisfactory. They compare even more than favorably with a Widal reaction, a Shiek test, a diphtheria smear, or a urine examination in suspected nephritis. It is requisite, however, that the test be not only reliably performed, but also intelligently interpreted. It is of great importance, therefore, that the clinician should acquaint himself sufficiently with the principles and technic of complement fixation, as applied to the Wassermann test, and the difficulties of it, so that he will be able not only to use the laboratory advantageously, but also to interpret its reports properly and intelligently.

With such understanding he will be impressed with the necessity of taking his specimens under aseptic conditions, his syringe, needles, containers and stoppers being sterile, perfectly clean and dry, and free from anything alkaline or acid, and all other due precautions being taken in reference to his patients as to conditions which might cause misleading reports. He will withdraw sufficient blood, about five nils (c. c.) if possible, preferably in wide necked or tube-form vials, and will himself separate the serum from the clot, if feasible, and, if not, he will in either case send the specimen to the laboratory at the earliest possible moment so that it will arrive in the best possible condition.

He will learn that a moderately positive or doubtful reaction is not sufficient for a diagnosis, unless backed by other strong points, and that in such cases the test should be repeated until a definite positive or negative is established. He will learn not to accept a single reaction, be it positive or negative, which is against his clinical judgment of the case, until repetitions have proved that the reaction is right and that he is wrong. Thus, when in doubt about a positive or negative report he will understand that repeated tests giving uniform results is excellent evidence of its accuracy. He will become acquainted with the fact that a knowledge of the laboratory he uses, its standards, technic, and method of reporting is more important in obtaining the information he desires than the reports from a number of laboratories. He will discover that it is much better to have a test repeated several times in such a laboratory than to have single tests made in several laboratories. And finally, he will learn that the Wassermann test, like any other laboratory test, is only an aid to diagnosis, though an invaluable one, and that it cannot in any sense of the word either supplant or eliminate a thorough clinical examination of his patient from every angle possible.

Such intelligent co-operation between the laboratory and the clinician will lead to much more satisfactory understanding of the results of the test, and in such way the value of the Wassermann test can be greatly enhanced by the clinician himself.

V. Technic and Method of Report.

The technic of the Wasserman test employed at the State Board of Health Laboratory is a modification of the original Wassermann test, as developed by Park, McNeil and Schwartz, and used at both the New York State and the New York City Department of Health Laboratories. The technic differs from that of Wassermann in the five following respects: (1) **One-tenth** the amounts of all the reagents used by Wassermann, carefully measured with accu-

rately graduated pipettes; (2) a **constant** amount of alcoholic antigen of medium strong sensitiveness; (3) **icebox** fixation at 8 deg. C. for four hours; (4) sheep-rabbit amboceptor with a **titer** of at least **1-1500**; (5) reading results **as soon as the control tubes are completely hemolyzed**, after eight minutes at 37 deg. C., thereby eliminating any natural sheep amboceptor as a factor.

In addition to the absolutely equal reliability of test with this smaller volume, the saving of material and cost is considerable, and many specimens sent in by physicians can be tested, which would otherwise be impossible for lack of sufficient amount of serum. Even as it is, too many specimens have to be discarded for this reason.

In reading and reporting the tests Citron's standard is used: Four plus denoting a very strongly positive reaction; three plus, a strongly positive; two plus, a positive; one plus, a weakly positive; the "plus or minus" sign, a doubtful; and minus, a negative reaction. In this scheme for reporting, the varying numbers of plus signs theoretically indicate roughly the comparative amounts of the so-called antibodies present in the specimen. Nothing under two plus is to be regarded as a positive in an undiagnosed case, though in cases under treatment one plus and "plus or minus" reactions indicate the need of further treatment. Of syphilitic patients under treatment it hardly seems necessary to have tests made oftener than every three months. As an indicator of the efficiency of treatment during its course, this method of report constitutes a more convenient and definite relative gage of the results than other methods. At times, it might perhaps be somewhat better and a little less confusing to report reaction simply as positive, doubtful and negative. This is, however, open to question.

Application blanks to accompany Wassermann specimens are furnished to physicians by the laboratory on request. These blanks constitute the original file of the laboratory, and in order to make them of statistical value it is especially urged that physicians not only use these blanks but fill out completely **all** the data requested thereon, including their clinical impression of the case insofar as syphilis is concerned.

VI. The Wassermann Test as an Index of Cure.

Any standard adopted for a serologic cure must necessarily be an arbitrary one. Requiring a continuously negative Wassermann reaction of both blood and spinal fluid and an absence of all signs of activity of the disease for a period of three years after the cessation of all treatment, may be regarded as such a standard. Observation for a period even up to ten years may in reality be necessary. The earlier the treatment is begun and the more intensive it is from the very outset, the greater seems to be the likelihood of obtaining a serologic cure. Late cases are often extremely resistant, and often cases of hereditary infection with late treatment, especially those with involvement of the central nervous system, seems to be equally hopeless as far as their serologic cure is concerned.

Whether a syphilitic patient, clinically well, must submit to treatment till his Wassermann reaction is negative and remains so, is at present a very absorbing question. If we believe, as the experience of most investigators would indicate, that a persistently positive reaction means the presence of living spirachetes somewhere in the body, then

we must also believe that, though the patient be clinically healthy and his lesions inactive, he is still infective, always subject to potential manifestations of syphilis, and, theoretically at least, in need of a complete serologic cure. If, on the other hand, we believe with Udo Wile that " in the presence of intensive therapy a positive test does not necessarily mean living spirochetes and potential syphilis, any more than a positive tuberculin test in an individual who has had tuberculosis would indicate the presence of living tubercle bacilli," then we need not believe that a clinical cure necessitates a corresponding serologic cure.

If, however, it is true, as Strickler and his associates have recently claimed, that the intravenous injection of arsphenamin in non-syphilitics will change a negative Wassermann into a positive, then attempts to make a persistent positive reaction negative by further intensive treatment may even be worse than useless. Furthermore, if the use of arsphenamin really produces the result as stated, it might in fact eliminate the Wassermann reaction as a serologic guide to treatment. As yet there is no confirmation of Strickler's claims, and much additional evidence would be required.

In old syphlitics who have been well and systematically treated for at least three years and who show no clinical symptoms, yet whose blood shows a persistently strong Wassermann positive, what should be the course of action? Shall they be subjected to further intensive treatment in an attempt to effect the so-called serologic cure, or shall they be consigned to that ever growing list of permanent Wassermann-positives and be dismissed with that? In such cases, according to Pollitzer and others, it seems that such further energetic treatment is no longer required, and that they need only occasional short courses of treatment over a number of years to prevent the manifestation of any syphilitic lesions.

In still another class of patients, well past the age of fifty, who do not show and have never shown any clinical symptoms of syphilis and who have had no treatment, the physician in the course of a thorough clinical examination happens to find a continued positive Wassermann reaction. What should be the line of procedure in these cases? Should an attempt be made here by energetic treatment to reduce their positive reactions to negative, or, on the other hand, should no treatment at all be given? Against the possibility of death in these cases from cerebral hemorrhage some years later, due to syphilitic changes in the arteries, there must be placed the great distress necessarily involved in prolonged anti-syphilitic treatment, and the grave doubt, even then, that such treatment would eradicate the spirochetes! Pollitzer recommends that such cases, as a rule, should be let alone, believing, as he says, that "the man who has carried his spirochetes for thirty or forty years without being even aware of his condition may well be allowed to carry them undisturbed for the rest of his days."

Since the diagnosis of syphilis is becoming more and more general and its proper treatment more and more prevalent, physicians are being increasingly confronted with the question from their syphilitic patients as to when they may get married. In view of the vital importance of the answer, from the social and family aspect, the attitude of the physician as to his responsibility and action in the matter is of the greatest moment.

As there is no certain criterion of the cure of syphilis, except a fresh infection, have physicians the right to pre-

vent syphilitics from marrying, and, if so, under what circumstances and conditions? If physicians are too severe and drastic, will not such patients lose the habit of consulting them? That the physician may be able to give his consent to such marriage, how shall he best enact his part in order to enable syphilitics to fill a normal role in family and society? How shall he decide, and what stage, standard and index of cure shall he require before giving his consent?

To these questions no answer can be attempted in the present paper. The problems are brought up in this connection only for the purpose of referring them to the physicians of the state for their consideration and solution.

Finally, despite its handicaps and the obscurity of its mechanism, and despite the fluctuations of opinion as to its value and significance, the Wassermann test must be regarded as not only an invaluable and often indispensable aid in the diagnosis of syphilis, but in the vast majority of cases as the only exact means of determining the necessity for further treatment.

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*In this paper I have not been limited merely to personal experiences and observations, but have obtained facts and statements of value from whatever source available.—H. M. S.

Discussion:

Dr. Kenneth M. Lynch, Charleston. There is no real object in entering into a technical discussion of the Wassermann reaction before a body of this kind. What the general practitioner wants to know about it has been ably and clearly stated in Dr. Smith's paper. Unfortunately, when you commence to talk about laboratory methods the general practitioner usually throws up his hands—he thinks this is a highly specialized department of medicine —something he can not understand, which is a great mistake. Understanding all we know about the Wassermann reaction is very simple and there is no reason why anyone who has ever done any laboratory work cannot understand what the most informed laboratory man actually knows about the Wassermann reaction.

In the present state of the situation it is doubtful if any standardization of the Wassermann reaction technique can take place, as is probably evidenced by the fact that failure to standardize it has taken place. The standardization lies in the man who is doing the Wassermann. Anyone who has a Wassermann to be done ought to know who is going to do it and that he is a reliable person. No one deplores more than I the tendency nowadays to employ as laboratory specialists people who have no knowledge of medicine or anything concerning it except a short course of technical training. To my mind that is one of the most dangerous situations in medicine today, when the practitioner of medicine is depending upon people who are unreliable to give him what should be reliable information. There is no reason why these laboratory tests should be done by uneducated people, any more than there is a reason why we should develop a surgical technician for the removal of the uterus. Unfortunately, I think the general profession does not understand this, so we must commence to preach to those who are not in this sort of work that a dependable test can only be done by a dependable person, and when this is done it is up to the man who is treating the case to apply it. No laboratory specialist can make a diagnos's. The physician must make the diagnosis with this laboratory test as a part of his armamentarium.

Dr. J. H. Gibbes, Columbia: In my judgment Dr. Smith has presented to us a paper which in order to reach its final purpose must be carefully studied, not simply heard as read. This paper sets out to lay before the general profession the technical features of the Wassermann reaction in a clear manner. The final interpretation of the Wassermann test is not with the laboratory workers themselves, but with the clinician. I think Dr. Smith in his paper, if he has made a mistake, has done so in being rather too conservative concerning the value of the Wassermann test. While it is a non-specific serological reaction, never-

theless the practical application of this test is a matter of very exact character. I have reviewed my records of 97 cases of syphilis; 92 gave a positive Wassermann reaction in either blood or spinal fluid, giving a conformity between the clinical evidence and the reaction of 92.9 per cent. Four of these patients gave negative Wessermann reactions in the presence of clinical evidences of syphilis, a non-conformity of 4.2 per cent. In the 97 cases one patient gave a false positive reaction—the reaction was sent back 4-plus when on subsequent investigation it was proved the first reaction was a mistake. That is practically 1 per cent of the group. I think that this degree of conformity should be intensely gratifying to Dr. Smith, who is doing the work for the State Board of Health.

There is a question as to whether serological cure should be attempted. I think it should. We must admit that the Wassermann test may not be an absolute criterion as to the cure of the patient, but it is the best we have. The serological test is the standard by which we must be governed at present, and I strongly urge that every patient who still shows serological evidence of syphilis be encouraged to take treatment until the Wasserman is negative.

Dr. M. H. Wyman, Columbia: I had the privilege of working with Dr. Keidel of Johns Hopkins Hospital, who devotes his entire time to syphilis. He also is in charge of the laboratory and is in peculiar position to give reliable information both from the clinical and the laboratory point of view. I spent a full day with him two weeks ago, so I quote him. Dr. Keidel is of the opinion that in this climate of the United States a positive Wassermann, properly done, means syphilis and nothing else. A man should be treated, and not regarded as cured until the Wassermann is negative, irrespective of the number of doses of salvarsan. He believes in pushing mercury and potassium iodide with it, in different forms, not only by mouth, but rubs and every form. He believes syphilis is curable except when it gets into the nervous system. You can arrest it there, but not cure.

I also took up with him the method we have of reporting Wassermanns—1-plus, 2-plus, etc. The physician receiving the report has to turn over the sheet to see what these signs mean. Dr. Keidel condemns this method. It is confusing to the general practitioner. To me a thoroughly trained technician is as good if not better than a doctor as a Wassermann worker. He is not interested in the clinical side of the case at all. He has the blood and the blood has to show one of three conditions —positive, negative or doubtful. Dr. Keidel has incorporated two other bits of information for the doctor. He says when the blood is doubtful it may be "suggestive positive" or "suggestive negative." I made this same plea before the Tri-State—why have these confusing signs? Why not use exact words? It would be so much better.

Dr. Gibbes made a statement which I did not know was true. I read an article recently written by an English army officer in which he said that a man could not have a primary lesion if he had not been cured of syphilis. Dr. Gibbes says he could. All that is new to me.

There is no action we can take, but I hope the laboratories will see fit to change their signs and report with English words so the physician will easily understand.

Dr. F. B. Johnson, Charleston: Among essential points of getting satisfactory results is in the manner of sending the specimen to the laboratory in the first place, and I want to emphasize what the doctor has said in regard to this. Specimens come in an unfit condition and the laboratory does the best they can, but that is often the cause of bad results. For best results, the specimen of blood should be allowed to stand until the serum has separated, this clear serum poured off and sent to the laboratory.

In regard to the interpretation and classification of the Wasserman findings into 1-plus, 2-plus, 3-plus and 4-plus, this system has been adopted by most of the laboratories and has been in use a long time, and I think we can get just as much information that way as if we say "negative, slightly positive, strongly positive, or very strongly positive." The classification Dr. Wyman mentions amounts to the same

thing in practice. I have been of the opinion that it is bad to give a doubtful result. It is either negative or to a certain extent positive, and by using 1-plus, 2-plus, etc., we not only aid in diagnosis but as far as treatment goes we can get some idea as to the effect. If the reaction is 4-plus and comes down to 2-plus we realize we are getting some results.

Another point is that very often doctors will send blood too soon after the last treatment has been given. I have seen cases where the blood was sent to the laboratory two or three weeks after the last treatment and you got a 4-plus test; that patient was allowed to rest without treatment for three months, and the test was negative, and remained so. That is an important point to bear in mind.

I have had considerable experience with the Wassermann test and it has been my opinion that a 1-plus reaction alone does not mean syphilis; a 2-plus alone does not mean syphilis; you must look for other evidences. A 3-plus is fairly strong evidence of syphilis, and if properly carried out a 4-plus Wassermann reaction means syphilis.

Dr. Elliott, Charleston: One phase the doctor did not mention, and that is the time at which the Wassermann becomes positive. As you all know, syphilis must be present in the body for a considerable length of time before the Wassermann becomes positive, and from recent experimental work done the spirochete becomes generalized in the circulation far sooner than we have suspected. It has been found that by inoculating rabbits and cutting off the testicle in 24 hours that did not prohibit the generalization of the spirochete, as it became generalized within four to forty-eight hours after inoculation. That phase I think deserves considerable attention, as it means the early diagnosis. The Wassermann reaction does not as a rule become positive until the primary sore has been present about twenty to thirty days.

Another point is the question of a permanent positive Wassermann reaction. We know that in many cases where the patients are not treated intensively the Wassermann is positive-fast. On the other hand, it has been demonstrated in the last year or two that those who treat this condition intensively get a great many of these cases negative. Pollitzer has advocated intensive arsphenamin treatment. This consists of arsphenamin injections every day for three successive days, followed by mercury for three or four weeks, and then another arsphenamin injection. Ormsby uses the arsphenamin every other day. I have found with the Ormsby method that a great many of these cases remain positive.

Dr. M. H. Wyman: Mr. President, I ask the privileges of the floor for another minute.

It does not necessarily mean when the plus signs come down (get fewer) that the case is getting better. That is what I get from Dr. Keidel, and I worked with him for twelve months. A positive Wassermann depends on antibodies, and antisyphilitic treatment ought to make more protective bodies. We stimulate by treatment the system to manufacture protective bodies. It is misleading to think that when in a new case a Wassermann comes down the patient is getting better. I am sure it is safe for the general practitioner if when the laboratory sends back a positive report he considers the patient has syphilis; if it is doubtful, repeat it; if it is suggestive positive, either repeat it or not. I am also certain it would be better for the busy practitioner if the laboratories would send back their reports—positive, negative, doubtful, suggestive positive, or suggestive negative.

Dr. F. A. Coward, Columbia: The desire to make it like other tests which it does not in any way resemble of course is strong. Under ideal conditions we would like to say "positive" or "negative," but the Wassermann test is nothing but a titration, and to sacrifice a report which indicates the extent of the reaction is sacrificing the essential thing in the test. It seems to me it is much better if a man is going to use the test to have him turn over the paper—let him turn over a few pages of a book—and if he does not know any more about it he had better let it alone. The thing is simple and the man who cannot understand and know just what these reports mean is really not being very much

benefited; he is only confused. Our constant effort with the test is to get it more uniform, so that one man's work can be synchronized with another's. Dr. Wyman says Dr. Keidel started with negative, doubtful and positive and now has had added the others. But we would not know what he meant by suggestive positive; the terms are too vague. The test is essentially a titration; 4-plus means that we have reached that point where we have complete fixation, but nobody knows how strong that test might be. We might run more tubes and get even up to 10-plus. That might be valuable in a clinical laboratory, but in a public health laboratory or in large institutions such a test is not desirable. I think i tis desirable to have at least five symbols, but I hardly think it necessary to make the change, because we are simply substituting five new symbols for five others.

Dr. Smith is fortunate in his work in that he does the entire test from beginning to end and has done practically 50,000 of them. A man who does that, I think, should not be disturbed without good reason.

SOCIETY REPORTS

LEXINGTON COUNTY

The song of the scythe, the rustling of corn, and the call of the Cascada announced to us that the pendulum of time had swung ajar its gates and ushered us into the seventh month of the year.

The sixth day of July chronicled a convention of Lexington County's Medical Society.

The day was typical and the Society was the guest of the Leesville Infirmary.

Nature has smiled upon this spot and the environments are such that could not help be pleasing to any individual who is at all appreciative.

In this setting is clearly portrayed the works not by human hands, but those of a Supreme Being.

All that human hands could do to make this meeting enjoyable, profitable and a success was done. Cleanliness was conspicuous everywhere as is characteristic of this little infirmary.

The business session was held in the lecture room in the presence of fourteen physicians.

Among these were Drs. S. E. Harmon and S. B. Fishburne of Columbia. Dr. Harmon is Councilor of this district and gave interesting discussions on various cases.

Tonsillar Infections was the topic of Dr. Fishburne's address and was very instructive.

Interesting clinical cases were exhibited by Drs. Frontis, Holly and Timmerman. The most phenomenal and interesting was that of a seven months old baby; a case of Meningocele exhibited by Dr. Price Timmerman.

After much discussion and examining of a number of patients the physicians repaired to the dining room, where a bountiful dinner was served. The table was very attractive with its bowls of blue hydrangea and white oleander.

Shasta daisies and place cards with witty sayings appropriate for physicians were favors.

As a whole, we believe this meeting was a success and the intent of its purpose accomplished.

The next meeting will be held at Lexington.

A Visitor.

LEXINGTON COUNTY

Meeting of Lexington County Medical Society was held at Leesville Hospital on July 6th.

President J. J. Wingard in the chair. Roll called, number present 6; number on roll 16. Visitors from other societies were: Drs. Black and Holly of Saluda, Frontis of Ridge Spring, Fishburne and Harmon of Columbia.

No papers were read but several clinical cases were shown and reports of cases were given, the following are some:

Dr. Fishburne reported a case with Iritis, Atropine used, Wassermann negative, tonsils infected, and after tonsils were removed the eye cleared up. He reported another case of Iritis with Wassermann positive the first time and negative the second, removed the tonsils and eye cleared up. He also demonstrated how by simple manipulation a patient with a throat condition as tonsilitis, peritonsillar abscess, etc., could drink fluids without pain.

Dr. W. P. Timmerman showed a child 7 months old with Meningocile, which was discussed freely by all present. He also reported a case of focal infection of prepuse, patient having convulsions and after circumcision he got well.

After this the society adjourned for dinner in the hospital dining room, where a most delightful dinner was served.

The next meeting will be at Lexington, the exact date to be fixed later, with the following to read papers: Drs. Ballinger and Wingard.

J. H. Mathias, Secretary.

GREAT INTEREST SHOWN IN SOUTHERN MEDICAL ASSOCIATION SPECIAL TRAIN FROM ATLANTA.

Numerous inquiries are being received by Dr. Allen H. Bunce, Secretary Medical Association of Georgia, and Mr. Pat B. Hampton, D. P. A., Seaboard Air Line Railway, regarding the special train which will be operated by the Medical Association of Georgia, to Hot Springs, Ark., account the meeting there Nov. 14th to 17th, as announced in a previous issue of this Journal. This train, which will consist of all steel Pullman drawing room sleeping cars, compartment cars and dining car, will leave Atlanta via the Seaboard Air Line Railway at 5:30 P. M., Saturday, Nov. 12th, going via. Birmingham, Frisco Railroad to Memphis, thence Rock Island Railroad to Hot Springs, arriving there Sunday afternoon, Nov. 13th.

Special Reduced Railroad Rates.

The railroads have named a rate of one and one-half fare for the round trip, for our meeting, tickets to be sold Nov. 10 to 16th, inclusive, with return limit of Nov. 31st. In order to secure this rate, you must have identification

certificate to present to ticket agent. You can secure these certificates from your local secretary, or from the Southern Medical Association office at Birmingham. Be sure to apply for your certificate early, so as to avoid confusion at the last minute.

As previously stated, all the physisians of the Southeastern States, together with their families, who anticipate attending this meeting, are cordially invited by the Medical Association of Georgia to join them on their special train. Requests for information or Pullman reservation should be addressed to Mr. Pat B. Hampton, District Passenger Agent, S. A. L. Railway, Atlanta, Ga., or Dr. Allen H. Bunce, Secretary, Medical Association of Georgia, Healey Building, Atlanta, Ga.

BOOK REVIEW

ESSAYS ON SURGICAL SUBJECTS

Essays on Surgical Subjects. By Sir Berkeley Moynihan, K. C. M. G., C. B., Leeds, England. Octavo of 253 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1921. Cloth, $5.00 net.

This is one of the most interesting volumes of essays off the press in a long while. The tribute to Dr. John B. Murphy by the author, in which he reviews not only Dr. Murphy's wonderful career but the entire history of surgery, is well worth the price of the volume alone. The essay on Gall Stones is also of the greatest value.

THE MEDICAL CLINICS OF NORTH AMERICA

(Boston Number, May, 1921.)

The Medical Clinics of North America (Issued serially, one number every other month). Volume 4. No. 6. By Boston Internists. Octavo of 297 pages, including complete index to Volume 4 and 35 illustrations. Per clinic year (July, 1920, to May, 1921). Paper, $12 net; cloth, $16 net. Philadelphia and London: W. B. Saunders Company.

Among the excellent articles in this number are the following:

Clinic of Dr. Henry A. Christian, Peter Bent Brigham Hospital, Right and Wrong Use of Diuretics, page 1639.

Clinic of Dr. I. Chandler Walker, Peter Bent Brigham Hospital, The Causes and Treatment of Seasonal Hay Fever, page 1673.

Clinic of Dr. Eliott P. Joslin, New England Deaconess Hospital, Practical Lessons for Physicians and Patients in Diabetes, page 1723.

Clinic of Dr. Francis M. Rackemann, Massachusetts General Hospital, The Vaccine Treatment of Asthma, page 1751.

Contribution by Dr. Horace Gray, New England Deaconess Hospital, Size and Weight in 130 Boarding School Boys (Middlesex), page 1899.

THE SURGICAL CLINICS OF NORTH AMERICA

(Boston Number, June, 1921.)

The Surgical Clinics of North America (Issued serially, one number every other month). Volume 1, No. 3. By Boston Surgeons. 345 pages, with 159 illustrations. Per clinic year (February, 1921, to December, 1921). Paper $12 net; cloth $16 net. Philadelphia and London: W. B. Saunders Company.

Some of the best articles in this number are the following:

Clinic of Dr. William P. Graves, given before the Boston Surgical Society at the Free Hospital for Women.

Multiple Postperitoneal Cystomata. Artificial Vagina. Menstruatio Praecos. Radium in the Treatment of Cervical Cancer. Radium in the Treatment of Menorrhagia of the Young, page 607.

Clinic of Dr. Robert B. Osgood, Massachusetts General Hospital, Tuberculosis of the Knee Joint. Angiona of the Knee Joint, page 665.

Clinic of Dr. William E. Ladd, Children's Hospital, Congenital Hypertrophic Pyloric Stenosis, page 797.

Clinic of Dr. Frederic J. Cotton, Chief Consultant in Surgery, U. S. Public Health Service, Park Hill Hospital, Boston, A "Reconstruction" Clinic, page 873.

Clinic of Dr. David Cheever, Peter Bent Grigham Hospital, Tuberculosis of the Mammary Gland, page 919.

Peptic Ulcer and Gastric Neurosis, page 927.

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